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| <b>SOLAR COLLECTOR<br/>CERTIFICATION AND RATING</b><br><br><br><br><b>SRCC OG-100</b> | <b><u>CERTIFIED SOLAR COLLECTOR</u></b><br><br><b>SUPPLIER: Solar Skies Mfg, LLC</b><br>800 Industrial Park, Hwy 28 West<br>Starbuck, MN 56381 USA<br><br><b>MODEL: North Star NSC-40</b><br><b>COLLECTOR TYPE: Glazed Flat-Plate</b><br><b>CERTIFICATION #: 100-2007-040F</b> |
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| <b>COLLECTOR THERMAL PERFORMANCE RATING</b> |   |   |  |                                    |  |   |  |
|---|---|---|--|------------------------------------|--|---|--|
| Megajoules Per Panel Per Day                |   |   |  | Thousands of Btu Per Panel Per Day |  |   |  |
| CATEGORY<br>(Ti-Ta)                         | CLEAR<br>DAY<br>23 MJ/m <sup>2</sup> ·d | MILDLY<br>CLOUDY<br>17 MJ/m <sup>2</sup> ·d | CLOUDY<br>DAY<br>11 MJ/m <sup>2</sup> ·d | CATEGORY<br>(Ti-Ta)                | CLEAR<br>DAY<br>2000<br>Btu/ft <sup>2</sup> ·d | MILDLY<br>CLOUDY<br>1500 Btu/ft <sup>2</sup> ·d | CLOUDY<br>DAY<br>1000 Btu/ft <sup>2</sup> ·d |
| A (-5°C)                                    | 58                                      | 44  | 30                                       | A (-9°F)                           | 55   | 42  | 28   |
| B (5°C)                                     | 53                                      | 39  | 24                                       | B (9°F)                            | 50   | 37  | 23   |
| C (20°C)                                    | 44                                      | 30  | 17                                       | C (36°F)                           | 42   | 29  | 16   |
| D (50°C)                                    | 27                                      | 14  | 3  | D (90°F)                           | 25   | 13  | 3  |
| E (80°C)                                    | 10                                      | 1   |  | E (144°F)                          | 10   | 1   |  |

A-Pool Heating (Warm Climate) B-Pool Heating (Cool Climate) C-Water Heating (Warm Climate) D-Water Heating (Cool Climate) E-Air Conditioning

Original Certification Date: October 4, 2007

### COLLECTOR SPECIFICATIONS

|                       |                      |                       |                           |                      |                       |
|-----------------------|----------------------|-----------------------|---------------------------|----------------------|-----------------------|
| <b>Gross Area:</b>    | 3.916 m <sup>2</sup> | 42.15 ft <sup>2</sup> | <b>Net Aperture Area:</b> | 3.580 m <sup>2</sup> | 38.54 ft <sup>2</sup> |
| <b>Dry Weight:</b>    | 72.1 kg              | 159 lb                | <b>Fluid Capacity:</b>    | 6.1 l                | 1.6 gal               |
| <b>Test Pressure:</b> | 1103 kPa             | 160 psig              |                           |                      |                       |

### COLLECTOR MATERIALS

|                           |                                    |
|---------------------------|------------------------------------|
| <b>Frame:</b>             | Anodized Aluminum                  |
| <b>Cover (Outer):</b>     | Low Iron Tempered Glass            |
| <b>Cover (Inner):</b>     | None                               |
| <b>Absorber Material:</b> | Tube - Copper / Plate - Copper Fin |
| <b>Absorber Coating:</b>  | Selective Coating                  |
| <b>Insulation (Side):</b> | Polyisocyanurate                   |
| <b>Insulation (Back):</b> | Polyisocyanurate                   |

### PRESSURE DROP

| Flow |     | Δ P |                     |
|------|-----|-----|---------------------|
| ml/s | gpm | Pa  | in H <sub>2</sub> O |
|      |     |     |                     |

### TECHNICAL INFORMATION

|  |                    |              |                            |
|--|--------------------|--------------|----------------------------|
| <b>Efficiency Equation [NOTE: Based on gross area and (P) = Ti-Ta]</b> | <b>Y Intercept</b> | <b>Slope</b> |                            |
| <b>S I Units:</b> $\eta = 0.691 - 3.3960 (P)/I - 0.0197 (P)^2/I$       | 0.706              | -4.9099      | W/m <sup>2</sup> ·°C       |
| <b>I P Units:</b> $\eta = 0.691 - 0.5985 (P)/I - 0.0019 (P)^2/I$       | 0.706              | -0.865       | Btu/hr·ft <sup>2</sup> ·°F |

**Incident Angle Modifier [(S) = 1/cos θ - 1, 0° ≤ θ ≤ 60°]**

|                              |             |                          |
|------------------------------|-------------|--------------------------|
| <b>K<sub>arr</sub></b> = 1.0 | -0.1939 (S) | -0.0055 (S) <sup>2</sup> |
| <b>K<sub>arr</sub></b> = 1.0 | -0.20 (S)   | (Linear Fit)             |

**Model Tested:** 100-2002-001A

**Test Fluid:** Water

**Test Flow Rate:** 39 ml/s      0.62 gpm

### REMARKS:

November, 2007

Certification must be renewed annually. For current status contact:

SOLAR RATING & CERTIFICATION CORPORATION

c/o FSEC ♦ 1679 Clearlake Road ♦ Cocoa, FL 32922 ♦ (321) 638-1537 ♦ Fax (321) 638-1010